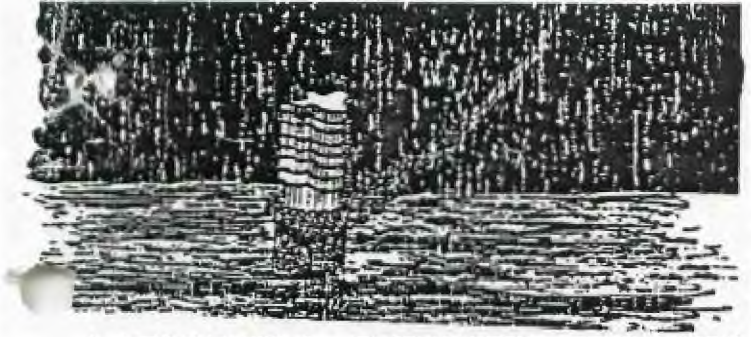


President Rowland Buckwalter 264-5790
Vice-pres Joe Birchak 759-4052
Secretary Ann Halko
Treasurer Mark DeNardo 791-1015

vol. III, no. 1 January 1985
Editor Frederick Hawkins 432-5913

LEHIGH 99'ER COMPUTER GROUP

Next meeting: Monday, Feb 18 Community Room, First Nat'l Bank
7:30 PM as usual. 7th and Hamilton, Allentown

hex to dec table

(0 - 65535 to 0000 - FFFF)

1-EX	DEC	HEX	DEC	HEX	DEC	HEX	DEC
0	0	0	0	0	0	0	0
1	4096	1	256	1	16	1	1
2	8192	2	512	2	32	2	2
3	12288	3	768	3	48	3	3
4	16384	4	1024	4	64	4	4
5	20480	5	1280	5	80	5	5
6	24576	6	1536	6	96	6	6
7	28672	7	1792	7	112	7	7
8	32768	8	2048	8	128	8	8
9	36864	9	2304	9	144	9	9
A	40960	A	2560	A	160	A	10
B	45056	B	2816	B	176	B	11
C	49152	C	3072	C	192	C	12
D	53248	D	3328	D	206	D	13
E	57344	E	3584	E	224	E	14
F	61440	F	3840	F	240	F	15

convert by the look

As we learn more about programming the need to convert Hexadecimal to decimal becomes a necessity. The conversion shouldn't be a stumbling block -- we can use a conversion table. Our particular table will convert any decimal number from 0 to 65535, or four hex digits.

The table is easy to use and is set up with four columns. Keep in mind that the Hex numbering system is a base 16 system as compared to our standard decimal base 10 system. How do we get 16 digits for a base 16 system? By using the letters A through F to represent the values of 10 to 15; thus, 12 is equal to C in hex. The highest digit in Hex is F, the 16th digit in a base 16 system. Looking at column 2 we find decimal 16=10 in Hex. Note we added the zero. (hex is positional, just like ordinary decimal. -ed) For 17 decimal we use the 10 in Hex + 1 from column 1 = 11 in Hex. Lets try a conversion with four Hex digits example:

```
Hexadecimal 1234= ?          another: AFFF= ?
  4096 - from column 4     40960 - from column 4
   512 - from column 3      3840 - from column 3
    48 - from column 2       240 - from column 2
+    4 - from column 1        15 - from column 1
------                    -------
  4660   in decimal       45055   in decimal
```

Alternatively, we can use the table backwards. To convert dec to hex we locate our number directly. If our number falls between two numbers on the table, we take the lower of the two numbers. We then proceed to the next column, selecting the number or span that comes closest to the remainder.

>Jack Schreiber

Like a ship 'round the Horn, the IO PORT is stuffed to the gills. We are navigating by the stars this month, and feature one or two. Setting a steady beacon, Jack Schreiber points the windward passage. Mayhap the going will be tempestuous, but the firmament of numbers is fixed and dependable. And well it better had, as we'll soon run out of fingers and toes to count them with.

A counter current draws us near a driftwood cluttered shore: they're boards. A native of these beaches, John Stover, hails us for the first time, spurring our pilot to spin a yarn or two about some other natives. Truly we've heard not the last from either, as John promises a tale of Dragons and Slayers, whence we return from our home port, IO.

A fisherman in his renamed sloop sails south. Its skipper, XEDITOR Dave Hendricks recounts his recent misses. And catches. Could be the biggest got away, than again maybe not.

The Lehigh 99ers lost the $300 claim against Green Pond Country Club.

A little known Lehigh fact: Allentown is only four miles from East Texas. Below is an editor's handyman. LIST a BASIC program to "DSK1.TEMP", then RUN this against it to get a 28 column screen image. And a note about the base 41 AL: I've an XBASIC program that generates the DATA as a MERGE file. Interested? Send a disk, a buck and return postage. It's worth it. Next month is DSR, DSKs and so on. >Frederick Hawkins

```
100 ON ERROR 160
110 INPUT "28 col file?":B$
120 OPEN #1:"DSK1.TEMP"
130 OPEN #2:"DSK1."&B$
140 LINPUT #1:A$
150 PRINT #2:SEG$(A$,1,28)&C
HR$(13):: IF LEN(A$)>28 THEN
A$=SEG$(A$,29,80):: GOT
O 150 ELSE 140
160 RESTORE #2
170 LINPUT #2:A$ :: PRINT A$
 :: GOTO 170
```

BBS: LOCAL	and announcing
3 months on-line!!!	
CALTEX #16	BBS3* (final tests)
215-258-5235 (Easton, PENNA)	215-252-8867 (Easton, PENNA)
SySop: John Stover CoSysop: Mike Mattes	Sysop: Mike Mattes *New Horizon's BBS

CALTEX #16 reports—

The board is getting a little busy now. As of 1/10/85, there have been about 1400 callers. About 10% of them from out of state, some as far away as California. It feels good to see that the board is starting to pick up so well.

The upload and download sections are working with little or no trouble. However, downloads have been changed a little. They are presently restricted to any person who has contributed 2 programs to the upload section or Lehigh 99'ers. The purpose of this is to get more programs for downloading to you. If you are a member of the group and feel you have a program to upload, feel free to do so. My library is not that big and if I list just mine, the board will always be the same. I am now looking for a mind twister to list in the file section. If you have one I would appreciate it. I will list you as the donator.

Also if you need a copy of the dataloader program let me know or call Mike Mattes and we will get one to you. There is also a working copy of dataloader in the "D" file on the board.

As some of you know, I now have a CoSysop. His name is Mike Mattes and we are now working on enhancements to the board. We have already added several. First we have added a software and hardware review section. Our present review, on SPELL-CHECKer (reprinted in this issue), can be found in the "R" file. We also have added a teasers section with this months teasers donated by Bob Roe and they're beauts. Last, we have added an adult board for people 21 years of age or older. This section is a separately RUN board. You must first access Caltex #16, then select "I" from the main menu for more information.

Last of all I would like to see more use from the Group. There are several members who have modems that don't call the board. (mea culpa) If you don't own a modem, give it a thought; it could be a worthwhile investment. The use of a BBS will make those once-a-month meetings seem closer. Log onto the board and get the latest TI activities and helpful information instead of waiting until the next meeting. Also, there is a lot of information on the board that the monthly meetings just don't have time to cover.

Please delete your messages after you have read them. It will help the board run faster. Let me know about any problems you encounter so I can correct them or give you the necesary help. You may always leave a message and someone will answer it. You might also find you can help others. I have observed how several users groups have turned a BBS into a important part of the group. LETS SEE IF WE CAN DO IT. If you have any questions about adding a modem to your system, feel free to ask and I will help you.

>John W Stover, SySop; Caltex #16

99 BBS (99 BomBS away!)
the information explosion

Even the least obsessed of users can hardly have been untouched by the single biggest 99/4A phenomenon of 1984. That is, redundantly, the virtual explosion of electronic bulletin boards (BBS) run by and for the 4A. There are very few newsletters indeed that don't either mention a local TI BBS or reprint information gleaned from the boards. Although I've no actual count, 99 doesn't seem an exaggeration.

In the forefront are the national subscription boards -- COMPUSERVE and the SOURCE. Local boards are giving both CIS and the SOURCE a run for their money; their saving grace is that they ARE national. The SOURCE features the recently refurbished TEXNET and the extraordinary SUBFILE99 which has gone from the personal files of one Mike Amundsen to a fully-acknowledged public access part of the SOURCE. SUBFILE99 is presently a bimonthly affair and probably comes close to the ideal magazine of the future.

In spite of SUBFILE99, COMPUSERVE looks more lively. Where the SOURCE seems to be either a one-man band or the harbingers of the past (TEXNET), COMPUSERVE apparently has real people trading information, articles and friendship. In this past month, I've received some files apparently downloaded from CIS, and am impressed with their thoroughgoing approach to 99/4A. Some names pop up: Earl Hall on AL LNKs, Don Donlan on Personal Record Keeping, Mack McCormick on system details, Kevin Lillard on TE II. There are others, of course; the point is that the advanced user is not neccessarily alone. In the horse race: the SOURCE for the SHOW and COMPUSERVE for THE PLACE.

offline with BBS3: learning curves

or what to get from New Horizons' public domain BBS

In the horse race, BBS3 for the WIN. Yes, there are other BBS programs for the 99 (like CALTEX), but none are public domain. BBS3 even includes a practical hardware circuit that answers and dials a phone -- total cost of parts under $30, duplicating a $600 device on the latest IBM clone. This could be easily modified to call the cops, turn on the toaster or control a simple waldo. Put together by a committee of programming users headed up by John Clulow and Ron Gries, BBS3 beats the others simply on price and heart. The price was right: $1 for handling.# The heart is evidenced merely by its existence.

Of BBS3's many features, the best is how much one can learn from it. On the XBASIC side: error trapping, linked lists, the passing of arguments to AL routines. On the AL side: multiple entry points, the utter simplicity of CRU control, turning external circuits on and off, using NUMREF & STRREF. Straddling the two are Ron Gries' hardware circuits, which nearly single-handedly bring the TI into true hackerland. (See this month's Northwest Ohio UG's newsletter for his and John's latest -- adding an 8k RAM to the ED/ASM cartridge.) Then there's how the TE II is controlled: screen colors, speech, cursor control. Finally, the workings of a big program, 90 sectors not counting the assembly files. The BB stands for Big Bertha.

Best of all, BBS3 isn't one of those tightly finished programs that crashes at the first touch. The code, though not subroutinized, is structured after a fashion -- the GOTO's make sense. In other words, there's room for YOUR improvements and BBS3 RUNs resiliently, in spite of wide ranging changes. My own version of BBS3, BBS9 (3^2=9) proves that. (BBS9 attempts to modularize BBS3 and enable complete offline testing; it succeeds at both but some of the modules are flaky -- write message, for one.)

In the pantheon of programs, BBS3's mix of XBASIC, AL and hardware put it well above the median somewhere between the shoulder and the toe of the learning curve. The XBASIC is accessibly low, close to the toe, but the AL approaches the shoulder. Ron Gries' circuits sit comfortably on top. Its public domain nature makes BBS3 an integral part of the common knowledge shared by all TI users. Even if one has no interest in bulletin boards per se, it can be a valuable addition to any users library.

```
ground] REC 0: top= 7
File's category is BBS's and Telecommunications
begin a message] REC 7:(next message 3) Records in message= 7
    message body rec 8,len= 66
    message body rec 9,len= 70       LINKED LIST EXAMPLE, USING A BBS3
    message body rec 10,len= 69       FILE.  MESSAGES ARE OMITTED AND
    message body rec 11,len= 71       LINKAGES ARE DISPLAYED. 'TOP' IS
    message body rec 12,len= 70       THE LAST MESSAGE ENTERED. 'GROUND',
    message body rec 13,len= 72       RECORD 0, CONTAINS CATEGORY.
    message body rec 14,len= 61
begin a message] REC 3:(next message 1) Records in message= 3
    message body rec 4,len= 59
    message body rec 5,len= 62      (output editted, program at right)
    message body rec 6,len= 28
begin a message] REC 1:(next message 0) Records in message= 1
    message body rec 2,len= 26
```

```
110 IMAGE begin a message] R
EC ##:(next message ###) Rec
ords in message=##
120 IMAGE message body rec #
#,len=###
130 IMAGE ground] REC #: top
=###
140 !P=1 :: OPEN #1:"RS232.B
A=4800"
150 DEF WORD(X$)=256*ASC(X$)
+ASC(SEG$(X$,2,1))
160 DEF WORD$(X)=CHR$(INT(X*
.00390625))&CHR$(X)
170 DIM ENTRY(20)
establish ground
190 OPEN #2:"DSK1.BOARD",INP
UT ,INTERNAL,RELATIVE
200 GROUND,INDEX=0
210 INPUT #2,REC GROUND:TOP,
CATEGORY$
220 LINK=TOP
230 PRINT #P,USING 130:GROUN
D,TOP
240 PRINT #P:"File's categor
y is ";CATEGORY$
create entry lis
260 ENTRY(INDEX)=TOP
270 IF TOP THEN INPUT #2,REC
TOP:MESSAGE$ ELSE INDEX=IND
EX-1 :: GOTO 320 !jump o
ut when list is grounded
280 TOP=WORD(MESSAGE$)
290 INDEX=INDEX+1
300 GOTO 260
print messages
320 CURRENT=LINK
get lead header
340 INPUT #2,REC CURRENT:HEA
DER$
350 LINK=WORD(HEADER$)
370 RECORDS_IN_MSG=ASC(SEG$(
HEADER$,11,1))
390 PRINT #P,USING 110:CURRE
NT,LINK,RECORDS_IN_MSG
get message body
420 FOR CURRENT=CURRENT+1 TO
CURRENT+RECORDS_IN_MSG
430 INPUT #2,REC CURRENT:MES
SAGE$
440 PRINT #P,USING 120:CURRE
NT,LEN(MESSAGE$)
460 NEXT CURRENT
480 IF LINK THEN GOTO 320
finish up
520 CLOSE #2 :: STOP
```

from BBS3: cassette remote code

```
      DEF  CS1,CS2      Name of routines' entry points for ED/ASM assembly,
*
NUMREF EQU  >200C       but these equates show that we're compiling for XBASIC.
FAC    EQU  >834A
*-----------------------------------------------

CS2    LI   R12,>002E   load CRU address of CS2 (software controlled) switch.
     s JMP  NO
*-----------------------------------------------

CS1    LI   R12,>002C   load CRU address of CS1 (software controlled) switch.

NO     CLR  R0          Reg 0 has element number when parameter is an array.
       LI   R1,1        Reg 1 specifies which value to get from the CALL LINK,
                        in this case we're interested in the first one.
                        Example XBASIC statement: CALL LINK("CS1",1).

     o BLWP @NUMREF     This utility accepts a value FROM BASIC.

       MOVB @FAC,@FAC   BASIC numbers are in Radix 100 (very accurate but slow)
                        The Radix 100 notation is ALWAYS returned in the PAD
                        location name FAC (Floating point ACcumulator) at >834A
                        and the next 3 words (8 bytes total).
*********************************************************************************
* RADIX 100, briefly:
* Multiply a number by 100 raised to a power:    num X 100^power
*
* Number range 1. 00 00 00 00 00 00  to 99. 99 99 99 99 99 99
*   Spaces indicate how the number is converted to hex and stored into FAC+1.
*   The decimal point is always assumed between the first two bytes.
*
* Power range: -64 to 64, 100^64 is HUGE! (that's 1 followed by 128 zeros)
*  The exponent is tricky, see page 279 in ED/ASM manual.
*
* pad locations, by the byte
*  @FAC   +1      +2   +3      +4   +5      +6   +7
*  834A  834B    834C 834D    834E 834F    8350 8351
* Power  Number:-each-byte-contains-two-decimal-digits
*            ^
*          decimal
*           point
*
* ZERO IS A SPECIAL CASE!  To express zero the power and first byte of the num-
* ber field contain 0.  In other words, FAC is equal to >0000.
*********************************************************************************

       JEQ  N1       When FAC equals 0 jump (MOV performs an equal=0? test)
       : SBO  0      Set Bit On at CRU address plus 0.
       !             THAT'S ALL THERE IS TO TURNING ON THE CASSETTE REMOTE     R
       !             CONTROL!!!
       !
       : B    *R11   Return to caller (XBASIC, in this case)
       !
*      !-------------------------------------
       /
N1     SBZ  0        Set Bit to Zero (off) at CRU plus 0 (CS1 or CS2)
     e B    *R11     Return
*-----------------------------------------------
```

CRU stands for "Communications Register Unit", TI's phrase for using the CPU's CRUIN, CRUOUT and CRUCLK and the address bus for medium speed I/O. "Unit", I guess, because nearly anything can be connected to these lines and "Register" because it'll have to remember what's passed. The 'CRU base' number is limited to 12 bits giving a 4096, maximum, different places for the I/O. There are fewer in practice, in part because some devices take a couple. And partly because there aren't that many. One has a choice in how to look at these 4096 addresses. Either we can look at them as numbered from 0 to 4095 or we can more simply think of them in their coded (as in the >2E & >2C) value. The former might be preferred because it reflects what's going to happen on the address lines. The CRU base is obtained by dropping R12's high three and the least significant bits. One may shift one bit right to find the value; >002E shifted will give >0017 or 23.

HOW IT WORKS, VERY SIMPLY: The twelve low address lines will get the sum of the CRU base (in current workspace's Register 12, always) and the opcode's offset (range -128 to 127). Data is then output through CRUOUT, input via CRUIN and both are signified valid by a pulse on the CRUCLK.

detailing the cassette port:

The plug is a 9 pin DIN female connector (Radio Shack 276-1538, $2.49) The pinouts:

pin # connections

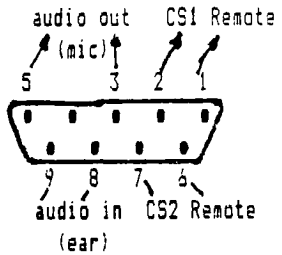
CS1 Remote 3/32" plug
1. tip (positive +5vdc)
2. sleeve (ground)

CS2 Remote
6. tip (positive)
7. sleeve (ground)

Audio Out (mic)
Parallel connection to 1 or 2 1/8" phone plugs.
3. sleeve (both plugs)

Audio In (ear)
8. tip (CS1 only)

CASSETTE PLUG



pin 5. tip (both plugs)

1/8" phone plug.
pin 9. sleeve

The remotes are ordinarily on, presenting a closed circuit to the cassette. This cooresponds to CALL LINK("CS1",1) or SBO 0 in the program. The system turns off the cassette only when a file is OPENed. Until the GROM tape routines are entered-- CLD, SAVE, OPEN -- you may rewind the cassette. If the console is turned off, the circuits are open. The remote circuits protect the CPU with the infrared optocoupler TIL 119, 'photodarlington'. The circuit can handle 5vdc with complete safety.

the asynchronous sieve

Looking for a lot of software at a low price? Maybe the Freeloader Software Library is for you. This library is a compilation of public domain programs for Atari, Commodore, TI, IBM, and Apple computers. The catalog that I looked at contained over 250 programs for the TI-99/4A home computer. The programs are not available separately but by full cassette or disk. Casettes contain several programs and disks are comprised of three cassettes. The cost of each cassette is $5.00 and a disk is $7.50. This could be quite a bargain if all the programs on the cassette or disk were ones that you needed. Unfortunately this is not usually the case. You can also purchase the whole collection of programs or several special collections. The entire collection sells for $150 for 25 disks or $225 for 60 cassettes. This price also includes six copies of the TI User's Guide which supplies the step-by-step instructions for using the public domain software with the TI and a complete index of programs. The various special collections sell for around $40. I must point out that many of these programs are currently in you user's group library and others are available from sources such as TEXNET and The International Software Club Inc. If you are interested in getting a catalog contact:

American Software Publishing Co.
2600 Connecticut Ave.
Washington, DC 20009

My sympathies for those who have tried recently to access SUBFILE99. It seems as though the January issue is late and there's nothing we can do about it. I have been trying for about two weeks to log on and as of January 15th have not been successful.

It seems as though we all have problems with bulletin boards at some time or another, but I have a real gripe about one in particular. The HUG TIBBS has been particularly troublesome for me lately. Operated by the Houston User Group, Sysop S.Foster, this board will remove your name from the active list if you fail to contact it at least once a month!!! I found out the hard way when I logged in on New Year's Day. I had to sign in all over again and read all of the sign-in procedures and wasted a good 5 minutes of long distance calling time!!! As it is I can't afford to spend too much time on line with their computer and they now rob me of that precious time. I have also left messages to the Sysop and have never received a reply. I have been told that this is one of the best boards in the country and that Steve Foster is one heck of a guy, but this still hasn't eased any of my problems. This is also the only board that I have used which penalizes you for not using it often. I'm getting very upset with this BBS and don't plan any future contact with it. Long distance callers beware, save your money for a better value!

One of those "better" values I eluded to is the "Top of Indiana" BBS. To reach it call 219-854-4787 24 hours a day. On it you can download programs (standard TE2 transfer), read articles, and post and read notices. I recently downloaded some reasonably good Forth articles from this board. I plan to use it more in the future. Give them a call sometime!

Here's a real bargain "online". If you have access to TELENET you can contact the BBS at the University of Manitoba for FREE!!!!! Here's what you must do

> Dial TELENET and when you get the "@" prompt type in c 0302093200233<enter>. This gets you online with UMBBS. Then type in "TLOGON UMBBS" and follow the prompts from there.

This is a free service with callers from all over the USA and Canada, so if you get "insufficient units" or "user ID not responding" it probably means it's busy. Hang up and try again sometime. This service is temporary so enjoy it while it lasts!

Feeling blue? Got some excess Source time burning a hole in your pocket? Maybe you should try "Comedy by Wire", the online funny line. By typing PUBLIC 163 DIRECT, you can reach one of the goofiest(?) uses for computer time I have seen yet. Run by comedian Billiam Coronel, this one has got some really strange but funny stuff.

TI PC OFFER: IUG members have a shot at a TI personal computer at significantly reduced prices. The lowest priced package I saw was a 128K computer with single drive and monochrome monitor, desktop model for $1622. This offer is only open to IUG members who can fulfill certain requirements.

INFOCOM, the producers of those fantastic adventure games, has just released three new games. CUTTHROATS is a pirate adventure, SUSPECT is about a murder story in which YOU are the prime suspect. The third is an adventure based on the Douglas Adams book "The Hitch-hiker's Guide to the Galaxy". I have personally read the first three of Adams' books and have listened to and watched PBS radio and TV shows produced from the books. If INFOCOM has treated this game in the same manner as PBS, then they should have a real winner here. I should know how good it is very soon as I ordered mine direct from INFOCOM in the beginning of January and expect it to arrive any day now.

For those of you who failed to get the programs offered by I.S.S. two months back, I have some good news! I received the following programs which can be

continued page 9, top left

at the bottom is a base

Watch this:

0	0	0	0
1	1	1	1
2	2	BASE.....	2
3	3		3
4	4		4
5	5		5
6	6		6
7	7		7
8	8		8
9	9		9
A	BASE.....		10
B			11
C			12
D			13
E			14
F			15
BASE.....			16

SEAT OF THE PANTS THEOREM: A 'numbering system' consists of a group of digits. A tighter definition would specify a 'set' of digits, implying that each digit is unique.

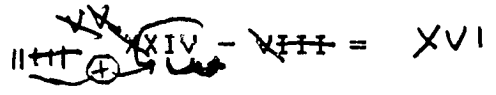
By arranging thess digits in a fixed manner, different numbers are specified. Thus, 10 is smaller than 11, as well as completely and uniquely different. Well, almost. 11 is equal to 10 plus 1.

Funny thing, though: The real quantities specified by 10, 11 depend upon the 'numbering base'.

If we suppose that they were in 'base 2 notation' (binary) from our usual decimal (base 10) point of view, we were talking about 2 and 3. If they had hexadecimal (base 16, hereafter hex), they were 16 and 17.

TWO IMMEDIATE OBSERVATIONS: 1) Numbers merely REPRESENT a quantity, they ARE NOT the quantity. In day-to-day use, a tacit agreement (codified by Law? One wonders), we use base 10. One suspects that this agreement is relatively recent -- Roman Numerals seem to lack the concept of base. Certainly, they lack the concept of different and unique digits. For instance, there is no 3, only three I's, nor is there any way to note zero. Although it seems inconceivable that the Romans didn't use their numerals for arithmetic, one balks at the thought of subtracting VIII from XXIV.

(Best method: factor XXIV minus VIII to X minus VIII, with a pending XIV. Replace X with VV, cancel one V in both VV and VIII leaving V and III. Replace V with IIIII and cancel three I's in both sides. Then add the remaining II to XIV by shifting the I II places-- XVI.



Anyone have a medieval accounting ledger handy?)

2) The number base is always one more than the highest digit's value -- the base counts 0 as a digit. A curiosity, sometimes handy: the number base expressed in itself is always 10.

The mentioned 'fixed manner' is more often called counting or enumerating. With just a little practice, one can count in any number base; knowing what quantity is represented is another matter. It may be enough that one knows that F is greater than C.

The hassle of bases turns on this point. Paid public servants (teachers) have pounded the relations of base 10 into our heads. We've money based on ten (another recent idea, thank you Ben Franklin). We've memorized tables of multiplication and division and miscellaneous tricks (any multiple of 9 will add up to 9, a number ending in 5 or 0 is divisible evenly by 5, etc.) But change our base and we become kids again.

Without our computers, ordinarily, we wouldn't even bother. In fact, much of software attempts to conceal base changes and the like. The TI keeps numbers in Radix 100 notation but keeps it to itself, thank god. However, there are times when we want to use hex or binary. Character and graphic descriptions (CALL CHAR, etc) require hex. Their images require binary.

buildbase

BASIC: decimal to any base
pgm by Fred Hawkins

```
100 PRINT "building set of n
umbers"
110 BA$="0123456789"
120 FOR A=65 TO 126
130 BA$=BA$&CHR$(A)
140 NEXT A
150 CALL CLEAR
160 INPUT "what BASE, oh mas
ter ":B
170 IF B<1 THEN 160
180 IF B>LEN(BA$)THEN 160
190 CALL CLEAR
200 PRINT "ENTER accepts.  C
will clear":"B resets base.
Q quits pgm"::::"base= ";B::
210 N$=""
220 PRINT "enter a number: "
;
230 CALL KEY(0,K,S)
240 IF S=0 THEN 230
250 IF (K=81)+(K=113)THEN 51
0
260 IF (K=66)+(K=98)THEN 150
270 IF (K=67)+(K=99)THEN 19
280 IF (K=13)THEN 340
290 IF (K<48)*(K>58)THEN 230
300 PRINT CHR$(K);
310 N$=N$&CHR$(K)
320 IF LEN(N$)=5 THEN 340
330 GOTO 230
340 N=VAL(N$)
350 PRINT ::N;" base 10"
360 E=N
370 A=0
380 B$=""
390 A=A+1
400 D=B^A
410 IF (D<N)*(B^(A+1)<N)THEN
390
420 F=INT(E/D)
430 B$=B$&SEG$(BA$,F+1,1)
440 E=E-F*D
450 A=A-1
460 IF (A<0)THEN 490
470 D=B^A
480 GOTO 420
490 PRINT :"= ";B$;" in base
";B::
500 GOTO 210
510 STOP
```

Interestingly, it's the 99/4A that determines our need to use binary and hex. Twenty-five years ago, machines (big ones at that) used a 6 bit instruction size. Programmers didn't use hex that much but perferred octal (base 8) because they could easily split the 6 bits into 2 octal digits. Converting an octal 5 to binary 101 is merely a different sort of skill, perhaps even less complicated than converting hex 5 to binary 0101. The octal user had a distinct advantage when it came to arithmetic. Addition and subtraction were straightforward. Multiplication and the like could be done in the head. Not surprisingly, the word size of early computers went up in multiples of 3 bits.

Back in the '50s (BC), programmers were pushed into the awkward position of writing for machines that required hex and octal skills. The good ones learned their multiplication and division tables! Starting in '62 (AC) or so, they were the first to jettison such and trade $100 plus for the early four function calculators. Nowadays, we can count on a cheap (our $100 is worth less) calculator that will do the job, no matter how big the instruction size gets (32 bits -- 4,294,967,295 max value-- is available now in microland).

Finally, binary owes its usefulness to electronics and logic. The micro revolution is pretty much a two-state land of on/offs, which fits nicely with a true/false logic construct. Three-state stuff exists but the logic doesn't really help: on, off, and not there. Could be that the logic is very nice, though, how about a trinary computer? Let's see, our word size ought to be 24 trits making 2 tryts of two sybbles each.....

OUR EXAMPLE PROGRAMS mix styles and systems. The first is a BASIC program that will handle conversions from decimal to any base from 1 to 71 or so. Moving through the systems, a quick hex-dec-hex converting routine for MINI-MEM and ED/ASM BASIC. (Incidentally, BASIC users will be pleased to note that this algorithm is nearly three times faster than any XBASIC equivalent.) Then a word or two about FORTH -- looking at binary and character patterns. And we end up with an unusual XBASIC SUB, CHECK41, which will LOAD an AL program from DATA statements that start with a BASIC LOAD address and ending with a decimal checksum (bytes are summed). 'Twist the two is the peculiar look of base 41 numbers. No, you won't have to create your own but merely turn the page -->

```
SCR #60
 0 ( QUICK CHAR IMAGE 30OCT84-16JAN85 FEH ) BASE->R HEX
 1 0 VARIABLE MYBUF 10 ALLOT ( about twice more than required )
 2
 3 : CHRBAS  8 * 800 + ;          ( chrnum --- chr pat addr TEXT mode base )
 4 : V.BUF  CHRBAS MYBUF 8 VMBR ; ( chrnum ---     charpat to buf )
 5
 6 : BIN 2 BASE ! ;  ( here's the tie-in to the article )
 7 : SKIP 20 HOLD 20 HOLD 20 HOLD 20 HOLD 20 HOLD ; ( 20= space )
 8
 9 : ROWR DUP 8 SLA + 0   ( byte ---      (# expects 32 bit num )
10       3 SPACES (# HEX # # SKIP      ( We use just 16 and fake )
11       BIN # # # # # # # # #) TYPE ; ( (# out with the 0 )
12
13 : SHOWIT ( ---    show the buffer character and its HEX value )
14   BASE->R CR CR 8 0 DO MYBUF I + C@
15   ROWR CR LOOP R->BASE ; R->BASE
```

hexpat
enhanced BASICS
pgm by Fred Hawkins

```
100 CALL CLEAR
110 PRINT "Pgm uses CHARPAT t
o get hex value from a decima
l number.":::"Maximum input va
lue is 32676"
120 PRINT :"It will be trunca
ted to the least significant
byte.":::"select a character n
umber"
130 CALL INIT
140 INPUT "(valid 32-159) ":C
150 IF (C<32)+(C>159)THEN 140
160 A=1024+((C-32)*8)
170 PRINT
180 INPUT "now enter a value"
:B
190 CALL POKEV(A,B,0,0,0,0,0,
0,0)
200 CALL CHARPAT(C,A$)
210 PRINT :"in HEX, that equa
ls ";SEG$(A$,1,2)::
220 GOTO 170
```

```
1300 SUB CHECK41 :: ON ERROR
 1350 :: READ ADDR :: IF BA$
="" THEN GOSUB 1360
1310 SM=0 :: FOR CK=1 TO 10
:: READ A$ :: IF A$="" THEN
1340
1320 B=0 :: C=LEN(A$):: FOR
A=1 TO C :: B=B+POS(BA$,SEG$
(A$,C,1),1)*L(A):: C=C-1
 :: NEXT A
1330 C=INT(B/256):: B=B-C*25
6 :: SM=SM+C+B :: CALL LOAD(
ADDR,C,B):: ADDR=ADDR+2
:: NEXT CK
1340 READ CH :: IF CH=SM THE
N READ A$ :: IF A$>"" THEN A
DDR=VAL(A$):: GOTO 1310
ELSE SUBEXIT
1350 PRINT "(CHECKSUM) ERROR
 AT";ADDR :: STOP
1360 BA$="123456789" :: FOR
A=65 TO 95 :: BA$=BA$&CHR$(A
):: NEXT A :: L(1)=1 ::
L(2)=41 :: L(3)=1681 :: RETU
RN :: SUBEND
```

base41, checksums, bbs & autoloaders

The apprehensive reader may have suspected this: That beyond the mechanics of graphics, base changes might serve some purpose. And would get written about.

Anyway, two problems come to mind and perhaps -- just perhaps -- base changes might do the trick. The first (and larger) area concerns downloading programs from BBS to a 99/4A. If we suppose that every TI has a Terminal Emulator II, then all sorts of programming difficulties are created. The BBS has to satisfy the TE II's 'protocol'. Although that's documented by TI, the hoops through which the BBS has to jump are pretty high or small or both. But, before rushing out to learn how to drive the TE II, remember there are other terminal programs, most better. However, all gag on TE II format and none (to my knowledge) can create a program file. One way around program files has been translating VARIABLE 80 to XBASIC MERGE file format. LISTed programs take more space though, sacrificing the BBS' disk storage. The MERGE program isn't directly RUNable and has to be retokenized. Whatever, this article can't do much, except to bring up a technique to consider.

The second problem is more at hand -- the publishing of XBASIC AL routines. Strike 1: space, strike 2: their keying-in, strike 3: errors. How many readers have missed a single number in a DATA statement? To LINK to a mistake is just that.

One possible solution is to use checksums, another is to use a better base than decimal, and a third is to use both. Another number base lets us fit more information in fewer digits. We'll use base 41, which fits 68920, max, into three digits. That's handy because one word of memory has a max of 65535. So one base 41 number replaces two bytes and up to 6 decimal digits with a max of three. One last plus for base 41: they don't look that much alike. That's their worst aspect, too. They don't look like much of anything -- yet. Hex didn't either at first.

About the AL programs: The first routine comes from MID-SOUTH 99 UG, PO Box 38522, Germantown, TN 38138 who credit Garry Noel (COMPUSERVE 75166, 324). Although the XBASIC system doesn't catch on, the screen display goes to TEXT mode. At the bottom are next 192 locations past the normal display. The second and third both use the user interrupt vector at >83C4 (-31804 for BASIC.) The first sets the screen color to a constant white on dark blue. Credit for this one goes to SUBFILE99. Curious because it lacks an entry in the REF table. Change the screen color by adjusting the byte at >24F4, 9460. The third is my ubiquitous cursor clock routine, included because it was on hand and I didn't have to type it in. The program is quite a bit bigger -- about 290 bytes long -- making it an excellent test of the CHECK41 subprogram (see page 7).

>Frederick Hawkins

```
1 DATA 8194,5Q^,9UP,,139
2 DATA 9460,\6L,CL,3C,VU3,5P
U,WCT,LD8,117,WCT,LD8,1883
3 DATA 9480,CL,1V,WCT,LD8,11
7,WCT,LD8,CK,W,W\J,1274
4 DATA 9500,5PU,LD6,\J,3KK,R
8,7BA,,1037
5 DATA -31804,5PW,,282
6 DATA
100 PRINT "loading XB consta
nt screen" :: CALL CHECK41
```

```
1 DATA 8194,5QR,9UJ,,376
2 DATA 9460,H^,K3H,CL,CPS,
WCT,K35,WCT,LD8,117,WCT,2288
3 DATA 9480,LD8,CL,\9X,WCT,L
D8,117,WCT,LD8,10A,,1602
4 DATA 16376,CXB,4CO,4CO,5PU
,,524
5 DATA
100 PRINT "loading 40 col sc
reen" :: CALL CHECK41
110 CALL LINK("T")
120 ACCEPT A$ :: IF A$="C" T
HEN CALL CLEAR
130 GOTO 120
```

```
1 DATA 8194,5WV,9UH,,369
2 DATA 9460,0,0,0,0,0,0,UJO,
UJX,U^H,V26,1194
3 DATA 9480,V4K,V6H,V8D,V9T,
VAY,VBE,54A,OO,5RE,8,2382
4 DATA 9500,5SP,5RU,B,2,5RC,
7BA,8JN,93W,9AC,9GL,1599
5 DATA 9520,K3H,5TY,TYX,6I1,
1AU,1AJ,6GA,5QN,5T_,5QN,1388
6 DATA 9540,5U\,6I1,1AU,1O,6
HJ,1AU,1O,6HC,QV,1O,1006
7 DATA 9560,6HY,1J,1O,6HY,1W
,QP,6HY,1W,1AQ,6HY,866
8 DATA 9580,1W,1AU,6HY,1W,1A
J,6HY,1W,2KB,6HY,2^,944
9 DATA 9600,1O,6IP,2JS,1O,6I
9,1AU,1O,PV,5RM,H^,988
10 DATA 9620,K2Q,LZ,PV,5RQ,H
^,K2Q,LZ,CK,OO,CL,1521
11 DATA 9640,5RE,CM,8,PV,4CS
,CN,5RU,TG6,TW,CQ,724
12 DATA 9660,5,CR,5TU,UI^,K2
U,LZ,FU,7D,2CS,YJ,1207
13 DATA 9680,LZ,TW,FS,5TK,2O
J,CN,5RU,\P,3EO,CQ,837
14 DATA 9700,5,DF,6,FT,5TK,2
O8,CO,5RU,TKZ,UK5,1138
15 DATA 9720,5RE,UK5,5RG,UK5
,5RI,ZEY,5RE,ZEY,5RG,ZEY,182
2
16 DATA 9740,5RI,PV,4CS,LZ,J
Y8,,585
17 DATA 16376,AA8,C2\,BI3,5T
K,,575
18 DATA
100 PRINT "loading clock pgm
" :: CALL CHECK41
110 CALL LINK("CLOCK")
```

asynchronous sieve from page 5

distributed as long as they are not sold!!! The programs are as follows: Shooting Arcade, Duck Hunt, Mr. Kitty, Santa's Run, Shipwreck, and the adventure program Phantom of Blackmore(three parts). Follow these rules to get them.

1. Send an initialized disk(sssd), preferably with programs on it to the address below. A C20 or C30 cassette can also be used but uses a lot of my time.
2. Include return postage and a note explaining where you read this and what you want. I get requests for other things too!
3. Wait paitiently for return of your disk. I'll try to hurry!
4. Send to Dave Hendricks, 1086 E Gordon St. Allentown, PA. 18103

I'll see to it that you get these programs. Sorry, I did not receive the music or educational programs. Did anyone out there get them????

Time for one more gripe, "unreturned disks". I have received many requests for copies of the TE3 program and have honored every one. However some people see fit to not return my disk to me. One user who would "kill to get TE3" hasn't returned my disk for over five weeks!! My only hope is that he is waiting for something really great to return on it. Complaints aside, I take my hat off to those who returned my disks speedily, as was usually the case.

> Dave Hendricks

system sale!!system sale!!

For the tidy sum of $600, the following PACKAGE DEAL is offered for sale by one FRANK MOYER, 198 MORRIS ST APT 2 PHILLIPSBURG, NJ 08865 (201-454-2359). (valid on Jan 17)

-hardware-	-software-
99/4A console w/cover & man.	Teach yourself XBASIC tape
Peripheral box w/	games & business: 5 tapes
32K memory expansion	(from TI Program Exch.
RS232 interface card	6 Radio Shack blank tapes
(disk drive? probably)	4 blank disks
TI cassette w/dual cable	TI WRITER w/disks and man.
TI joysticks	TI MULTIPLAN "
Atari " w/2 adapter cables	TI LOGO "
Speech synthesizer	----cartridges----
TI Tex-sette cassette adapter	Touch.Typ.Tut. MULTIPLAN
Extra power converter	Term.Emul.II TI WRITER
-miscellaneous-	Speech Editor Munchman
Desk, computer w/paper slot	Disk Manager Car Wars
Chair, black walnut padded	Video Graphs Alpiners
Cassette storage box	Pers.Real.Est TI LOGO
Cartridge storage box	Pers.Rec.Keep. Beg.Grammar
-books-	Sec.Analysis Reading Rup
101 Programming Tips	Mind Chall'ger Multiplic I
Using & Programming the TI	Football
Manuals, all hard. (extras)	--------NO XBASIC!--------
16 issues of 99'er Magazine	but whew! anyhow

what fits, fits

A CALL LOAD FOR A LOAD

I've been interested in finding a RUNable XBASIC CALL LOAD that would dependably RUN "DSK1.LOAD". Finally, one has turned up, in the damnedest, ahem amazing place. Among an abundance of public domain programs, files and downloads we received in an exchange with the SIOUXLAND 99'ers, was the music program "Amazing Grace". Authored by Cecil Crowder, it plays the tune, then does the LOAD. I don't know how it works, but it does. The screen colors are legitimate, the title screen is skipped. In short, this CALL LOAD is the one.

```
CALL INIT :: CALL LOAD(-31961,149)
```

That's equals >8327, and used by the console's BASIC interpreter.

Where's Plato, anyways?

A Lehigh 99er, Ronald Hartranft, wants to buy, rent, or borrow a Plato cartridge and disks. Leave your phone number care of his office, (215) 861-4109, and he'll get back to you.

References, credits, who's who

Rory Blinkerd, Pres: SIOUXLAND NINETY NINERS, 2124 W 19th ST, Sioux Falls, SD 57105

Bob Dilworth, Pres: NEW HORIZONS, 5 Mt. Vernon Dr, Waterville, OH 43566
Don Wollenbecker, Pres: OH-MI-TI, 1522 Reswick, Oregon, OH 43661
they publish cooperatively:
NORTHWEST OHIO 99'ER NEWS, c/o Roger Biddle, 218 Dillrose Dr, Northwood, Oh 43619

cassette pinouts, courtesy A9CUG CALL NEWSLETTER.
ATLANTA 99/4A COMP UG, PO Box 19841, Atlanta, GA 30325

THE PROBLEM WITH BBS ET AL

The name omitted is so he don't feel picked on for the wrong reason. The most wrong-headed piece published lately had to be a recent listing of all of the FORTH words in the manual's Starting FORTH appendix. That's not so bad by itself, but the accompanying prose firstly browbeat the TI people who put TI FORTH together, then secondly implied what a BIG FAVOR it was to publish all the WORDs. As a matter of fact, there's no earthly reason for TI FORTH to fit 100% with Brodie's book. And further, it was real nice of TI to try out everything in Starting FORTH, and note down all the differences, as well as figure out replacements. Advice: you've an big audience -- don't disabuse them. The most obnoxious HAS be HCM's baby boomer article in their advertising rag. This guy deserves his name drug thru the mud: Thomas Grundy. Speaking of crap, have you noticed that HCM's breaking new publishing ground? The last two issues include a 'tear-open' LIMITED LICENSE. Simply put, it won't hold water. (Read December's Computer Shopper)

SOFTWARE: TI WRITER compatible
99/4 AUTO SPELL-CHECK

DRAGONSLAYER SOFTWARE COMPANY

AUTO SPELL-CHECK is a two disk program which checks your spelling of TI WRITER files. SPELL-CHECK loads from the Utility option of TI WRITER's main screen. This package contains two dictionaries named A and B. It also allows you two create your own dictionaries of approximatly 2000 words.

After writing your letter with TI WRITER you must save (SF) it first. After saving, you need to exit the editor to the main screen. The next thing is to select option number 3 for Utility. Disk A must be in drive one. The first thing the program will ask you is for your letter's (or what-have-you) filename.

Now SPELL-CHECK begins to check your spelling with the built-in dictionary A. Next, you receive a prompt to insert disk B in drive one, enabling the program to complete its check with dictionary B.

After going through the built-in dictionaries, it will ask you for any personal dictionaries you want it to search. If you don't have any just hit ENTER.

Now you are taken to the menu which is

1. Next word
2. Previous word
3. Change word
4. Disregard word
5. View in Context
6. Add to your list.

At this point the words the program found are displayed one at a time under the menu. If the word is spelled correctly you can hit 4 or 6, 6 will add it to your previously created dict. 4 will just pass over it. If you are not sure if it is spelled correctly you can 'view in context', which shows you the word in its line. This is helpful for words that have different spellings for different ways they are used.

However, if the word is mispelled, that is where your trouble starts. You will need a dictionary if you don't know the correct spelling! This is the biggest problem: SPELL-CHECK DOESN'T GIVE YOU THE CORRECT SPELLING! Or even a hint as to what the correct spelling is.

It took approximatly 5 minutes to check this file and the program found about 10 words wrong, two of which were speiled wrong and the rest were spelled right but it didn't have them in it's dictionary. In my opinion, this package is not worth $50.00 it lists for. That it doesn't give you the correct spelling for words and doesn't have many words in it's vocabulary makes it, I think, a waste of $50.00. The only good point of the program is that it will find typographical errors.

THE VIEWS EXPRESSED IN THIS REVIEW ARE THOSE OF THE WRITER ALONE IF YOU HAVE ANY SOFTWARE OR HARDWARE YOU WOULD LIKE TO REVIEW PLEASE CONTACT ME AND I WILL BE HAPPY TO DO SO.
>JOHN STOVER

(Editorial footnotes: Item one: The IO PORT doesn't need a disclaimer -- the IO PORT likes an honest opinion.
Item two: It is not uncommon for users to react very negatively to a new program; I've gone through some pretty foul moods with the Editor/Assembler package. Although John's review might be dismissed as such, he also didn't pick on one of AUTO SPELL-CHECK's reported flaws -- it's SLOW. And SLOW means you won't use it. Remember MULTIPLAN? Item four: my wife checks my spelling; Coalumbus got by us both.)

P.O.Box 4837 * 1501 Lehigh St.
Allentown, Penna. 18103

stamp target
put it
here, pal
Allentown, PA.18102
PERMIT NO.2018